ICI MAGAZINE

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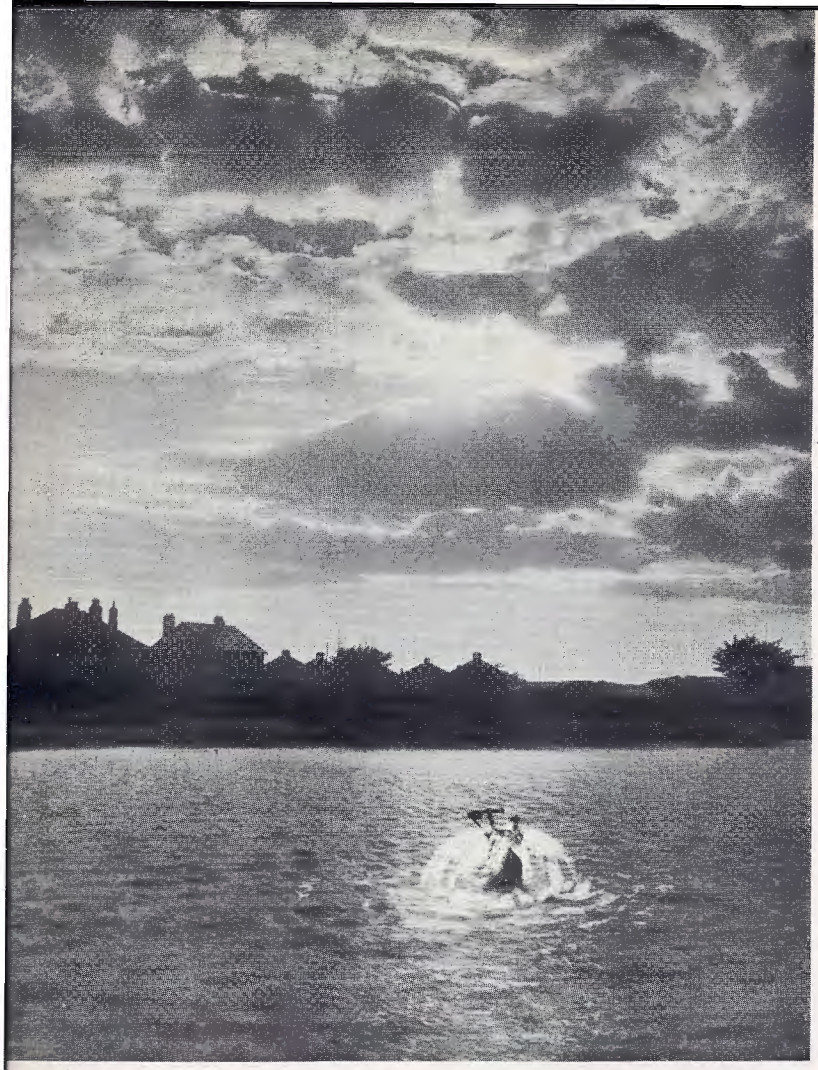

Brine reservoir

THE I.C.I. MAGAZINE

VOLUME 28 NUMBER 160 FEBRUARY 1950

The *I.C.I. Magazine* is published for the interest of all who work in I.C.I., and its contents are contributed largely by people in I.C.I. It is edited by Henry Maxwell and printed at The Kynoch Press, Birmingham, and is published every month by Imperial Chemical Industries Limited, 26 Dover Street, London, W.1. Telephone: REGent 5067–8.

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Front cover photograph: "Collecting Open Pan Salt," by Kynoch Press Studio.

Back cover photograph: "New Boiler Plant Steelwork, Witton," by T. Jones (Metals Division).

The Editor is glad to receive articles for publication. Payment will be made for accepted contributions. A preliminary letter is usually advisable.

Raw Materials of the Chemical Industry

SALT

ALTHOUGH salt is undoubtedly the most familiar of all chemicals—so much so that it is often called "common" salt—it is not generally realised that it is an essential raw material for the chemical industry. World production of salt is now about 25,000,000 tons a year, but of this not more than a tenth is used for flavouring and preserving food; the remainder is used by the chemical industry in making such products as washing soda, caustic soda, hydrochloric acid, chlorine, soap, and glass. In Britain roughly the same proportion between these different uses is found. Annual production is about 3,000,000 tons—much of it produced by the Salt Division of I.C.I.—but only a tenth of this is used with food. The remainder is taken up by the chemical industry.

The original source of all salt is the sea, and the simplest method of extracting it, still practised along the seaboards of hot countries, is to evaporate sea water to dryness in large open pans and scrape together the solid that is left. This source of salt is virtually inexhaustible, for calculation shows that if all the salt in the world's seas were brought together it would occupy a space of over four million cubic miles. This method of making salt by solar evaporation of sea water is, however, slow and laborious and yields a product of low quality; in consequence most of the salt used today is obtained by various methods of mining. In past ages whole seas have dried up, leaving deposits of salt scores of feet thick, and in the course of millions of years these deposits have become buried beneath thick layers of rock and soil. In our own times we can see the same change taking place in the Dead Sea, which is now so saturated with salts that its solid content is nearly one-quarter of the total. The mining of salt formed in this way has been carried on for centuries. In Britain it was extensively carried out in Cheshire and elsewhere from Roman times onwards, until widespread flooding of the workings made further mining impossible. Eventually, however, this flooding pointed the way to a new and simpler method of mining in which brine is simply pumped to the surface from the flooded strata of salt and evaporated to dryness. In Britain only one salt mine is still in operation: this is the I.C.I. mine at Winsford.

The brine is treated in various ways, according to the quality of salt required. Vacuum-dried salt consists of fine grains and is familiar as ordinary table salt. For industrial purposes, however, a coarser salt, made by evaporation in open pans, is usually required.

The industrial uses of salt can conveniently be divided into those in which the salt is used in its original state and those in which it undergoes a chemical transformation. Natural salt is used as a refrigerant, because a mixture of salt and ice freezes at a temperature far below that of ice alone. This fact is made use of in snow-clearing; if salt is

mixed with ice or snow the latter quickly melts unless there is a quite exceptionally severe frost. Large quantities of salt are used in the food industries, especially for the preservation of fish. Formerly salt was also widely used for preserving meat, but the development of better methods—notably canning or refrigeration—has very much reduced the quantity used for this purpose. Large quantities are used by the soap industry for "salting-out" the mixture formed by splitting up fats and oils with soda, itself a product of salt. When brine is added to this mixture the soap separates as a curdy layer which can be skimmed off. Another use for natural salt which has developed in recent years is in regenerating the materials used in water-softening plants. Other minor uses include the making of salt-licks for cattle, the glazing of certain types of pottery, the finishing of copper sheet, the making of dyestuffs, the tanning of leather, the case-hardening of metals, and as a fertilizer for certain types of crops.

The extensive use of salt for manufacturing purposes dates from the latter half of the eighteenth century. In 1775 the French government, embarrassed by the difficulty of importing soda in wartime, offered a prize for a method of manufacturing soda from salt, and in 1787 Nicolas Leblanc patented his famous process for effecting this transformation. For a century this process was to prove a mainstay of the chemical industry throughout the world, but it is one of the tragedies of chemistry that Leblanc himself did not profit in the slightest from his discovery. His patents and rights were confiscated by the revolutionaries in 1791 and, overwhelmed by poverty and ill health, he committed suicide a few years later.

In 1823 James Muspratt introduced the Leblanc process into Britain, where it was widely worked until displaced by the modern ammonia-soda process. The Leblanc process had certain inherent disadvantages. It produced clouds of noxious fumes, and for every ton of soda produced two tons of evil-smelling alkali waste were made. These two nuisances involved the alkali manufacturers in constant litigation with indignant farmers and landowners who, very naturally, objected to the pollution of their lands by near-by alkali works. Accordingly a great deal of attention was paid to a method discovered by a French chemist, Fresnel, in 1810. In principle this was simple enough, consisting merely in the treatment of brine with ammonia and

The almost shadowless sodium lighting which now illumines many main thoroughfares is indebted to salt. One of its chief features is a remarkably low consumption of current (Photo by courtesy of G.E.C. Ltd.)

One of the ingredients in every piece of glassware is soda ash, made from salt, lime and other chemicals

Chlorine and 'Chloros' also have their origin in salt. Many thousands of gallons of 'Chloros' are used in the interests of public health

It is a far cry from soda crystals to rayon dresses, and yet salt is the starting point of both, for caustic soda, used as a solvent, is indispensable in the production of rayon
(Dress by courtesy of British Celanese Ltd.)

carbon dioxide to form sodium bicarbonate and ammonium chloride. The sodium bicarbonate was then heated to form sodium carbonate, yielding at the same time carbon dioxide, which could be used again for the first part of the process. The ammonium chloride was treated with lime to regenerate the ammonia. The whole process was beautifully self-contained and thus came near to realising the chemist's ideal of an industrial process.

Unfortunately the technical difficulties proved immense, and perhaps no process has caused bigger disappointments and financial losses than the ammonia-soda process. Not until 1865, when the brothers Ernest and Albert Solvay began to manufacture soda by this process in Belgium, was success finally achieved. In Britain, John Brunner and Ludwig Mond saw the immense significance of the Solvays' discovery and acquired the right to work the process. Together they formed the firm of Brunner, Mond and Company and, despite great initial troubles due to lack of capital and to technical hitches, built up the great company which in 1926 was one of the four main firms involved in the formation of Imperial Chemical Industries. The effect of the Solvay process was sensational. By the end of the nineteenth century production of soda had increased fivefold and the price had been cut by three-quarters. The Leblanc process became obsolete, despite countless improvements and economies effected in the hope of competing successfully. By the outbreak of the first world war Brunner, Mond & Co. were supreme, and today the manufacture of soda by the Solvay process is in the hands of their successors, the Alkali Division of I.C.I. This Division now produces one-seventh of the world's soda.

At about the time that this revolution in the making of soda was taking place there had settled in England an American chemist, Hamilton Y. Castner, who was to effect a further considerable expansion of the salt industry. Castner had perfected a process for manufacturing metallic sodium by heating a mixture of caustic soda, iron, and carbon. Failing to gain support for his discovery in New York, he came to London in 1886. His demonstrations of the process attracted the attention of the Webster Crown Metal Company of Birmingham, which was using sodium for the manufacture of aluminium, then a metal whose high cost (about £3 per pound) made it little more than a chemical curiosity. At that time the Birmingham firm were paying 14s. or more per pound for metallic sodium; by Castner's new process it could be made for 9d. per pound. The result of the application of the new process to the making of aluminium was a large drop in the price of the metal, with the result that for the first time it began to come into general use. Unfortunately for Castner, this process for making aluminium was soon rendered obsolete by the better electrolytic one perfected independently by Hall in America and Héroult in France.

After this piece of ill luck Castner's only real asset was his process for manufacturing metallic sodium cheaply from caustic soda. With characteristic perseverance he therefore turned to the manufacture of sodium compounds, especially the cyanides, which were being increasingly required by the rapidly growing gold industry. This venture proved so successful that he turned his attention to improving his method of manufacturing sodium. Very soon he developed an excellent method for making it by the electrolysis of molten caustic soda; but owing to impurities, especially silica, in the commercial caustic soda then available he found that the electrodes needed constant replacement. As this replacement was both expensive and time-consuming he decided to attempt to manufacture for his own use caustic soda of such high purity that full advantage could be taken of his new continuous process for manufacturing sodium. His ultimate solution to this problem was the famous mercury cell for the electrolysis of brine. The first of his cells came into operation in 1894 and yielded caustic soda of almost 100% purity, then unheard of in the alkali trade. Chlorine, which can be used for manufacturing bleaching powder, for purifying water supplies, and for other purposes, is a valuable by-product. Castner took immediate steps to patent his new process throughout the world, but encountered difficulties owing to the fact that an Austrian chemist, Carl Kellner, was patenting a similar process, the rights in which he had assigned to the Solvay Company. Fortunately litigation was avoided and an amicable arrangement reached. The outcome was the formation of the Castner-Kellner Alkali Company in 1895. Today this is a very important part of General Chemicals Division, and consumes large quantities of salt for the making of caustic soda by the mercury-cell process, and for the manufacture of metallic sodium.

The supply of salt from Salt Division to other Divisions of I.C.I. illustrates the general way in which the products of one part of the Company are the raw materials of another. Thus, in 1948, General Chemicals took 13,000 tons of salt for making metallic sodium; Nobel 2000 tons for making explosives; Dyestuffs 6000 tons for dyeing; Metals 100 tons for fluxes and for finishing copper sheets; and Billingham 300 tons for water softening. In all, Salt Division supplies the rest of I.C.I. with about 35,000 tons of salt every year.

I.C.I. NEWS

LORD McGOWAN'S SIXTY YEARS' SERVICE

On Monday, 25th November, 1949, the Chairman, Lord McGowan, K.B.E., D.C.L., celebrated the sixtieth anniversary of his joining Nobel's Explosives Co. Ltd. in 1889.

Mr. John Rogers writes:

"Our Chairman's career reached on 25th November last a point worthy of very special attention by all of us who are serving with him in this Company. It is not only the fact of this long service which is remarkable, but also the manner of its achievement. We have here a splendid instance of rising from the ranks. When a lad he obtained a job as office boy through replying to an advertisement placed in a newspaper by Nobel's Explosives Co. Ltd., Glasgow. Without any influence or power except such as was in himself, he progressed steadily and speedily to the highest industrial position in this country—indeed I would not quarrel with you if you said in the world, for those of us who work for I.C.I. have no mean opinion of its importance.

"In a case like this one would naturally like to ask the Chairman: 'To what qualities do you attribute your advance?' Now, modesty would forbid Lord McGowan to answer. But there is no reason why I should not make an attempt to reply for him, having known him for fifty years.

"To begin with, he is, and always has been, a sentimental Scotsman with a very good head for business. He has an excellent memory, and well do I know it, through venturing in my younger and less cautious days a bet or two with him on past events. Of the many fine traits in his character I would mention particularly two—punctuality, and the capacity to notice opportunities when they arise and speedily to do something about them.

"All of us know what an excellent mixer he is with all ranks and conditions of people. During many years he has from time to time visited almost all I.C.I. factories and establishments, and I need not tell any of you, whatever your position, how delightful these contacts are and how valuable they have been to our Company.

"The incidents of his successful progress and their effect on the fortunes of Nobel's and later of I.C.I. are fairly well known. They have had, I consider, a profound influence on many other industries as well, and will always remain an inspiration to the younger generation towards keeping up the old spirit of determination and enterprise. Throughout, Lord McGowan has had the help of his charming wife, who has the affection of all who know her. The human touch and the personality of the Chairman, expressed in so many ways and amidst all walks of life, are among the experiences which we in I.C.I. have been fortunate to possess and will always remember."

I.C.I. BOARD CHANGES

The appointment of Mr. J. L. S. Steel as Overseas Director and of Mr. W. J. Worboys as Commercial Director in the place of Mr. A. J. Quig, who has relinquished that office on account of his other duties as a deputy chairman of the Board, was announced by I.C.I. Board on 8th December. Mr. Worboys will remain responsible for the Paints and Plastics Group.

ALKALI DIVISION

Death of Mr. John Astbury

We record with great regret the death of one of the oldest retired employees of Brunner, Mond and Co. after a short illness at his home in Barnton, on Monday, 26th December. Mr. Astbury was 13 years old when he joined the Winnington works of Brunner, Mond and Co. in August 1877.

He often told the tale of his joining—how he, along with other local youths, used to squeeze through holes in the works fence for the devil of it. One day he was captured by the foreman and set to work carrying oil to the blowing engines. At the end of his first week he found himself the owner of Works Number 166 and the princely sum of 3s.

He worked after this in the Time Office, but later was moved to the Laboratory. Here he was faced with decimals, which were not, in those days, taught at school, so he went to evening classes to learn what they were all about—a determination which was characteristic of him all his life.

His most cherished memory of his days in the Laboratory was

Mr. John Astbury

brushing the dust off Dr. Mond's long coat when he had finished his tour of the works. He saw the launching of the first steam-driven barge in the Brunner, Mond fleet (the tank-barge *Courage*) and remembered picking mushrooms on his way to work on what is now the site of the Winnington Crystal Plant.

John Astbury became distiller foreman in 1907, rising to full foreman status in 1915. He finally retired in 1930 as senior foreman at Winnington with 53 years' service behind him. He has served as a trustee of the Mond Pension Fund and was a member of the advisory committee at the time of his death.

His natural vigour found an outlet during his retirement in the public life of Barnton—his native village—for which his energy and integrity made him most suitable. There was hardly a local committee on which he had not served in the last twenty-odd years, and he retained his sprightliness and clarity of intellect right up to his final illness.

Trade with the Argentine

Following enquiries from "Duperial" Argentine Mr. S. Stevens, General Manager of the Alfloc Water Treatment Service, has flown to Buenos Aires to explore the possibility of opening up sales of 'Alfloc' products in the Argentine.

In the past, water treatment chemicals for South America have been supplied largely by American companies, but owing to devaluation and their lack of dollars the Argentine has begun to look to the British chemical industry for the supply of these materials. Mr. Stevens left London Airport (Heath Row) on 28th December and reached Buenos Aires two days later.

BILLINGHAM DIVISION

Retirement of Prominent Athlete

A well-known figure in North of England athletic circles, Mr. C. W. Starnes has retired from Billingham Division after 30 years' service. Mr. Starnes went to Billingham in 1929 as a draughtsman after some ten years' service with I.C.I. (Japan).

Mr. C. W. Starnes

In 1939 he was promoted design engineer, and four years later was made assistant manager of the Central Services Section of the Engineering Department—a post which he held until his retirement.

Mr. Starnes has always been keenly interested in amateur athletics, in his younger days as an athlete himself and later as an official. For some 42 years he has been associated with the famous Blackheath Harriers and for several years with the well-known member of that club, Sidney Wooderson, whom he persuaded to attend Billingham open athletic meetings on two occasions.

He was for many years a Northern Counties Athletics Association judge, and for the last sixteen years he has been its district secretary. Mr. Starnes is also a member of the English Cross Country Union and a past president of the North and North Eastern Cross Country Association. As a grand climax to his sporting career Mr. Starnes was appointed one of the judges at the 1948 Olympic Games.

At one time chairman of the Synthonia Club's Athletic Section, Mr. Starnes has always taken the keenest interest in its activities, and his kindly advice, drawn from nearly half a century's experience, will be greatly missed.

On 30th November, the day of his retirement, Mr. Starnes was presented with a silver tea service by Mr. P. Mayne, the Chief Engineer, on behalf of his many friends in the Billingham Division.

"Did you say fish?"

A White Lie

Following correspondence in the Press, research has been carried out at Billingham to test the belief that pure white cats are born deaf or dumb or bereft of both senses. Susie and her kitten, who keep watch and ward in the Electric Workshop, are both pure white—although the kitten sometimes looks as if it has been on night shift in a coal bunker—and both give ample evidence of having good hearing and are certainly not dumb.

Mr. G. C. Pollard, who is *Magazine* sub-correspondent for the department, has a white cat of his own, however, that is both deaf and dumb, although she has developed methods of making her wishes plainly known. Of other white cats interviewed, some have proved themselves deaf but not dumb and others dumb but not deaf, but the general conclusion seems to be that white cats are no more subject to these disabilities than any other kind of cat.

Mr. and Mrs. A. G. Handy with their marionettes

DYESTUFFS DIVISION

Mr. A. G. Handy's Marionettes

Mr. A. G. Handy, Assistant Labour Officer at Derby Works, and Mrs. Handy recently made headlines in the local press, when they took their marionette show to the Derby Deaf Institution to present the story of "Sleeping Beauty" to a large number of deaf children. Altogether Mr. and Mrs. Handy have 24 marionettes, including two circus horses "Thunder" and "Lightning" which were the runners-up for the Haslam Cup for marionettes in pairs at the annual national exhibition of the British Puppet and Model Theatre Guild. Mr. Handy, who has been with the Company for nearly thirty years, is the honorary secretary of the Recreation Club of Derby and Spondon Works, and also runs a boys' club in his spare time.

I.C.I.A.N.Z.

Death of Mr. S. D. Hull

As we go to press we learn with deep regret of the death at the age of 49 of Mr. Seymour D. Hull, manager of the Yarraville factory of I.C.I.A.N.Z., on 1st January after a brief illness.

Mr. Hull started work at the Mount Lyell Mining and Railway Co. at Yarraville in 1916 as a cadet chemist. He was therefore one of the pioneers of the chemical industry in Australia. He joined I.C.I.A.N.Z. when the chemical factory at Yarraville was taken over in 1936 and became works manager during the war.

Although Mr. Hull was a "dinkum Aussie," his forbears having sailed from this country over a hundred years ago, he had a profound love for the land which he always referred to as home. In the summer of 1948 he and Mrs. Hull paid their first visit to this country—a visit to which they had looked forward all their lives. They undertook an extensive tour of I.C.I. Divisions and offices and also attended a meeting of the Central Works Council in Blackpool, where Mr. Hull made a speech.

It was Mr. Hull's expressed intention that during his visit he would, in addition to the technical work he had undertaken on behalf of I.C.I.A.N.Z., do everything in his power to promote friendship between the staff and workers of his beloved Yarraville and their opposite numbers in I.C.I. In this he was everywhere successful. He had a gift for establishing terms of friendship with people almost as soon as he had met them—a gift which could only have been exercised by one whose sincerity

and good will were entirely out of the ordinary. He came prepared to see and appreciate, and when he returned to Australia he never missed an opportunity to speak in praise of this country.

Readers of the *Magazine* will recall Mr. Hull's amusing and instructive article published in the September 1948 issue on Australian football, a game on which he was a great authority. He was senior vice-president of the Footscray Football Club and delegate of this club to the Victoria Football League, which controls Australian football in the State of Victoria.

In the General Chemicals Division Mr. Hull will be especially warmly remembered, for it was his kindly thought which prompted the employees of Yarraville to send food parcels to their colleagues in General Chemicals at every Christmastime since the war—a most generous act which has drawn the association between these two parts of I.C.I. all the closer.

Dr. S. W. Saunders

LIME DIVISION

Dr. S. W. Saunders

Dr. S. W. Saunders has been appointed chairman of the Lime Division in succession to Mr. L. G. Sewell, who retired from the Company's service on 31st December.

Dr. Saunders joined Billingham Division as a research chemist in 1926 and later became works manager of the Gas and Power Works. In 1940 he also became works general manager and in 1945 was appointed to Billingham Division Board. He became Production Director in 1948.

Retirement of Mr. G. W. Thomas

Mr. G. W. Thomas, Commercial Managing Director of the Lime Division, retired on 31st December, having completed more than 42 years' service with the Company.

At the request of the Government he was seconded to the Ministry of Supply as Deputy Plastics Controller during the war and he continued in that office until October 1944, when he returned to Buxton on his appointment as Commercial Managing Director of the Lime Division.

Mr. J. W. Vernon

Retirement of Mr. J. W. Vernon

With the retirement of Mr. Joe Vernon of South Central Workshops, Lime Division have lost another old and trusted friend with more than half a century of service. Mr. Vernon started his career at Buxton as long ago as 1897 as a messenger boy, and has worked at South Power, Hindlow and Cowdale as well as South Workshops. For the last twenty years he has been a chargehand electrician.

METALS DIVISION

Landore Memorial Plaque

A memorial plaque bearing the names of 67 Landore employees who fell in the second world war was unveiled by the works manager, Mr. C. W. Trickett, at Landore on 15th November.

The plaque was dedicated by the Vicar of Hafod, the Rev. Leslie Norman, and wreaths were laid by Mr. G. H. Rogers on behalf of the Company, and by Capt. R. Williams and Mr. T. Fisher on behalf of members of the factory.

Presentation of Long Service Awards at Swansea

Eighteen awards for service of 40 years and over were presented to employees of Metals Division's South Wales factories by Sir Arthur Smout, I.C.I. Metals Group Director, at a dinner held in the Lightning Fasteners canteen at Swansea on 8th December.

At the head of the list was Mr. W. Rowland, formerly sheet mill superintendent at Landore, who had completed more than half a century of service when he retired in October 1941.

Mr. J. E. Malam, the director responsible for Swansea Works, presided, and the guests included Mr. A. M. Kempson (Joint Managing Director), Mr. M. J. S. Clapham (Personnel Director), Mr. C. H. Rogers (Regional Production Manager), the works managers of Swansea, Landore and Lightning Fasteners, and representatives of joint consultative bodies in the factories and of the trade unions.

Sir Arthur Smout in his after-dinner speech emphasised the theme "It's the man that matters." "You can buy machines, develop processes, build up 'know-how,' but you cannot buy men," he said. "Loyalty and devotion, on which the success of a company are built, are plants of slow growth, requiring careful nurture to bring them to maturity."

Giant Castings

Some of the largest brass castings ever to be made have been cast at the Plate Mill of Metals Division's Elliott Works recently. The castings are circular, with a diameter of 4 ft. and a thickness of 15 in. and weigh nearly 4 tons each. They will eventually be rolled into circular plates of various thicknesses for manufacture of oil-refining plant.

Multum in Parvo

A carburettor so small that it can be hidden between a man's clasped hands is now in production at the Amal factory of Metals Division. It is designed to fit on pedal cycle auxiliary engines of about 40 c.c. capacity which transmit power either by friction on the front tyre or directly through the rear wheel. The idea has already been adopted in many European countries and seems likely to prove popular in Britain.

Despite its small size the new Amal carburettor is of orthodox design, with miniature float chamber, piston throttle and needle jet control. The main jet is of the normal pilot jet size.

Dr. George Parker

Dr. George Parker, of Witton Research Department, has recently been appointed chairman of the Scientific and Technical Section of the Birmingham Photographic Society. The section includes some of the leading medical, natural history and industrial photographers in the district and frequently receives visits from distinguished photographers from other parts of the country. One of the first visitors since Dr. Parker's appointment was the chief photographer of New Scotland Yard.

Dr. Parker is assisted by Mr. E. Taylor, who made an auspicious start in his training as a professional photographer by gaining first-class honours in the preliminary examination of the Institute of British Photographers.

British Legion Presentation to Mr. B. J. R. Evans

Mr. B. J. R. Evans, manager of Marston's Component Manufacturing Department, was presented on 28th November with an illuminated address as a mark of esteem and appreciation of his work as chairman of the Wolverhampton branch of the British Legion from 1945 to 1948. The presentation was made by the present chairman, Mr. E. C. Currivan.

Mr. Evans originally joined the Old Comrades Association, Birmingham (later the British Legion), in 1919, but had to let his membership lapse in 1923 when he was transferred to Wolverhampton, which at that time had no branch of the association. He rejoined the Legion at Wolverhampton in 1944 and is now chairman of the South Staffs County Branch and sports committee, honorary treasurer of the Haig Fund, Wolverhampton, and a committee member of the Wolverhampton Branch.

It was during Mr. Evans' chairmanship of the Wolverhampton branch that it was awarded the Jellicoe Cup, presented by the late Admiral of the Fleet Earl Jellicoe for annual award to the branch which has obtained the best results in employment work.

Silver Jubilee of the Kynoch Cricket Club

Twenty-five years of active club cricket were celebrated by the Kynoch Cricket Club at a dinner held at Witton on 20th October, at which nearly ninety guests, nine of them pensioners, were present. A most interesting history of the club over the years from 1919 was given in the souvenir programme.

Mr. B. P. Cooke of the Costs Office, Metals Division, Witton, has reproduced in marquetry the front cover for the September 1948 issue of the Magazine. *Among the several wood veneers used are sycamore, oak, satin butt, figured and Italian walnuts, Honduras and other mahoganies, plane, poplar, and hornbeam. Each slender piece of material is carefully chosen for colour and texture and then cut and inlaid with or against the grain to add light and shade.*

NEWS FROM THE REGIONS

Portuguese Government Award to Mr. N. S. Grieve

The President of Portugal has caused a medal to be struck to commemorate the twentieth anniversary of the inception of the Portuguese Wheat Campaign. One of the first recipients of the medal is Mr. N. S. Grieve, Agricultural Sales Manager of the Northern Region, who has also received a letter of appreciation from the Portuguese Government.

Prior to 1929 Portugal was a wheat-importing country, and the idea of a national campaign was mooted in order to increase home food supplies. The Portuguese Government instituted the wheat campaign with a view to utilising all modern methods. Fresh strains of hard wheat were imported, and various soil investigations and agricultural methods were closely studied. It was realised that fertilizers would play an important part in increasing production, and all supplies of nitrogen had to be imported. As one of the prime producers of synthetic nitrogen, I.C.I. was asked to collaborate in the campaign, and Mr. N. S. Grieve was lent by the Company for this purpose. Experimental and practical work was extended throughout the length and breadth of the country, and as a result of these combined efforts

and the application of science to agriculture the production of home-grown wheat was increased very appreciably; in fact, Portugal actually became an exporter of wheat.

NOBEL DIVISION

The late Mr. G. H. South

With the death of Mr. George Henry South on 5th October at the age of 86 the Company has lost an old and trusted servant and his many colleagues in I.C.I. a much-loved friend.

G.H.S., as he was affectionately known, had a long and interesting career in the gunmaking and cartridge business, and owing to his extensive knowledge he was looked upon as a great authority on shotgun ballistics. He started his career with a prominent firm of West End gunmakers and in 1896 left to take up a position with Nobel's Explosives Co. at Ardeer Factory, where he managed the Ammunition Section. In 1907 it was decided to transfer this branch to Waltham Abbey, and Mr. South, along with a number of Ardeer workers, laid the foundation for the loading of Nobel shotgun cartridges in England.

In the early days of 1912 he visited Canada to assist with manufacturing there, and was later appointed manager of the Ammunition Section at Kynoch's Footscray Factory, Melbourne.

For many years he was a prominent and expert shot both at live pigeons from traps and later at clay pigeon shooting.

After eighteen years in Australia Mr. South retired and returned to Waltham Abbey, where he lived with his younger daughter until the time of his death.

Father and Son Pensioners

Father and son, both I.C.I. pensioners, were among the guests at the pensioners' Christmas dinner at St. Rollox Works on 22nd December. They were 83-year-old Mr. Bernard Brady, who served with the Cassel Cyanide Co. for some 30 years, and his son Mr. Joseph Brady, who retired in 1945 from St. Rollox after 33 years' service. Two of Mr. J. Brady's sons have also served with the Company for short periods.

Caught by the Camera

Mr. Arthur Winter (Sabulite Garage Staff) is a keen amateur photographer who gets great pleasure from nature studies, although his principal work is portraiture. One October morning a friend told him that, only just a few fields from his home, a fox could be seen by cautious people. Mr. Winter hurried with his camera and managed to record the intriguing picture we publish below. As the camera clicked, the fox bounded away.

PAINTS DIVISION

Retirement of Mr. W. L. Colmer

On 31st December last Mr. W. L. Colmer retired from Paints Division Board after 35 years' service.

Mr. Colmer began his career as a marine engineer, spending nearly five years at sea in Far Eastern waters. On his return to this country in 1913 he got his Chief's ticket and then decided to leave the sea and joined the staff of West Ham Corporation as a junior engineer. Two years later he joined Nobel's Explosives Company and went to Stowmarket to assist in the extension of the guncotton and cordite plants. In 1918 he was engaged on the construction of the present cellulose works there and shortly afterwards became Works Engineer.

After a break which lasted from 1925 to 1933 he rejoined the Division as Group Engineer and was made a director in 1940. During the 1939–45 war he was seconded to the late Lord Melchett's Special Arms staff as an Assistant Director of Ordnance (Explosives).

Mr. Colmer was mainly responsible for the construction of Paints Division's Smethwick works and also of the new paints factory at Somerset West, South Africa. He will continue to act as an engineering consultant to Paints Division.

PLASTICS DIVISION

The 1948 Leon Gaster Memorial Premium of the Illuminating Engineering Society has been awarded to Dr. W. E. Harper, of the Technical Service and Development Department of Plastics Division, and Mr. H. P. Walker, of Southern Region, for their paper on "Acrylic Plastics in Lighting," which they presented at the society's summer meeting at Harrogate last year. The award is made by the society each year in memory of its first president, Leon Gaster.

SALT DIVISION

War Memorial Unveiling Ceremony

On Tuesday, 13th December, Mr. R. Bennet, a director and Chief Engineer of Salt Division, unveiled the memorial plaque in memory of the following employees of Tennants and Clarence Works who lost their lives in the 1939–45 war:

W. HARRISON, Trpr. Royal Armoured Corps
C. PLANT, Trpr. Royal Hussars
W. SNELSON, Gnr. Royal Artillery
J. WEEDALL, Gnr. Royal Artillery

The service of dedication was conducted by the Rev. J. H. Darling, Vicar of Haverton Hill, and wreaths were laid by Mr. R. Bennet, Mr. G. P. Griffiths (works manager), Mr. T. C. Loraine, Mr. S. C. Brown and Mr. G. Whitehouse on behalf of South Durham and North Yorkshire Saltmakers Association.

An Unbroken Record

Members of Stafford Works A darts team are to be congratulated on their unbroken record of successes in 1949. Having won each of the 15 matches they played, they are now top of the local darts league with a 7 points' lead over their nearest rivals.

* * *

Review notices of the Plant Protection book, *Fruit Growing for Amateurs*, which was commended to I.C.I. gardeners in the September 1949 issue of the *Magazine*, have been reaching Bolton House from all over the world. One of the most succinct came from Lagos, West Africa, and runs "My God and dear readers, what a book!"

This story was told by Mr. R. Roberts, the Plant Protection director in charge of publicity, at a recent dinner of the Company of Farmers.

110° below Zero

In the twenty-odd years since the introduction of solid carbon dioxide, 'Drikold' has become well established as one of the principal weapons in the cold war against losses of perishable foodstuffs. Its influence has spread along other channels until it has become an important factor in several industries, notably brewing and mineral water manufacture, engineering and aircraft construction—even in the film industry and in the new practice of making rain in times of drought.

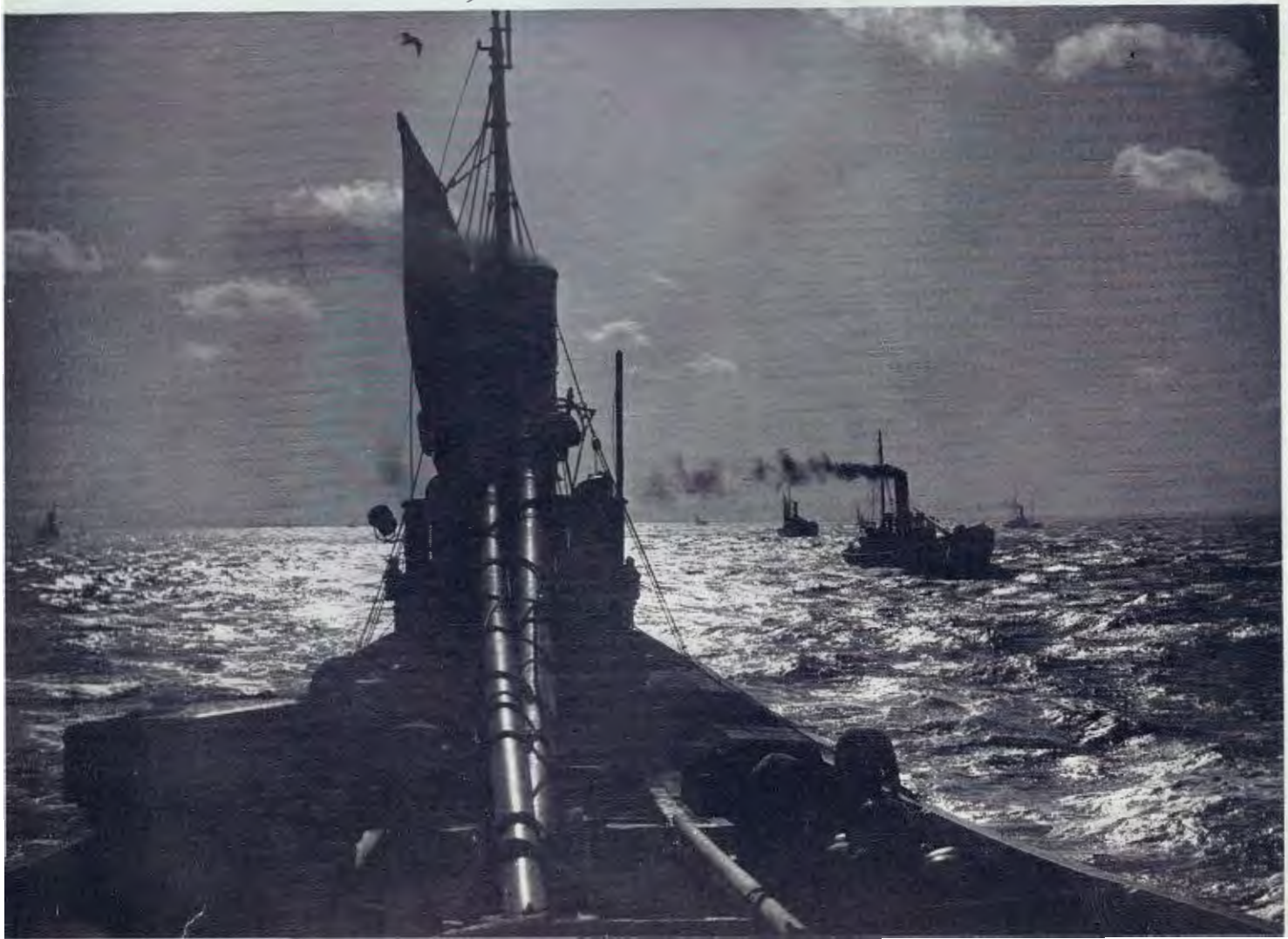
Although not the only makers, I.C.I.'s production figures for solid CO_2 under the trade name 'Drikold' are immense. Development of the technique of manufacture was a triumph for our chemists and engineers. In making 'Drikold,' carefully purified carbon dioxide gas is compressed, cooled and liquefied. When the pressure is released, the liquid carbon dioxide changes to a snow-like solid which is subsequently compressed into blocks of 'Drikold.'

In this series of pictures some of the many uses of 'Drikold' are presented to remind readers of the scope of one of Billingham's most interesting products.

Modern methods of distributing frozen meat include provision for 'Drikold' refrigeration. Very large tonnages of 'Drikold' are used each year to prevent the thawing which would be followed by deterioration. ▷

Wet fish and kippers in transit from port to market also require special care. 'Drikold' alone in the vans will keep kippers and other cured fish in good condition; wet fish requires ordinary water ice as well as 'Drikold.'

▽



(*By courtesy of J. Lyons & Co. Ltd.*)

The ubiquitous ice cream and other confectionery delicacies depended solely on local manufacturers until it was made possible by the use of 'Drikold' to sell famous makes in every town and village.

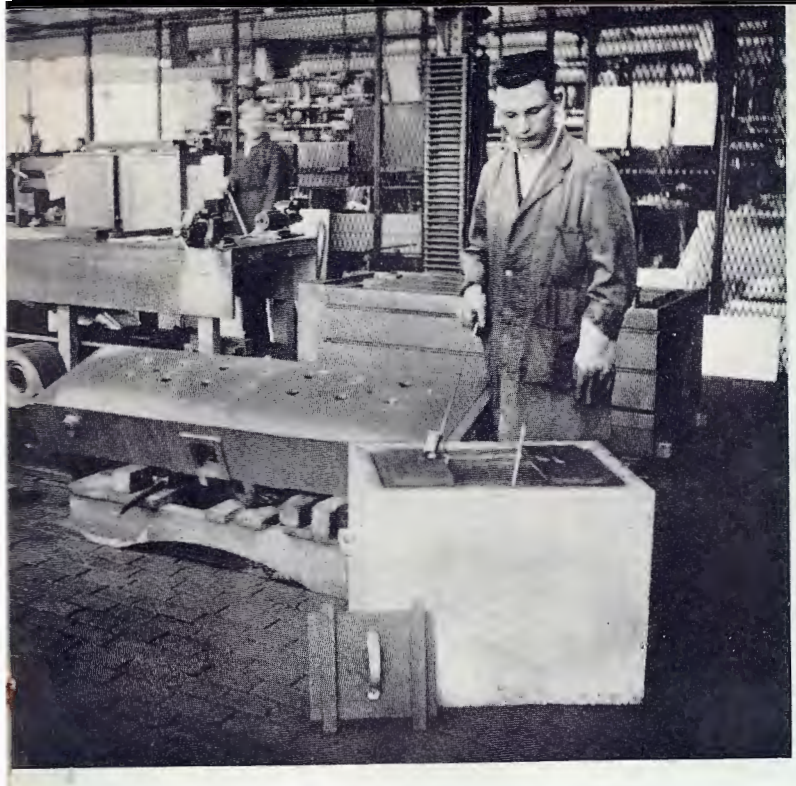
Δ

Fruit-growers, too, have found that 'Drikold' refrigeration assists in the marketing of highly perishable products such as strawberries, raspberries and cherries. Such fruit can now be sent to markets which otherwise would be too distant to reach without risk of serious loss of quality.

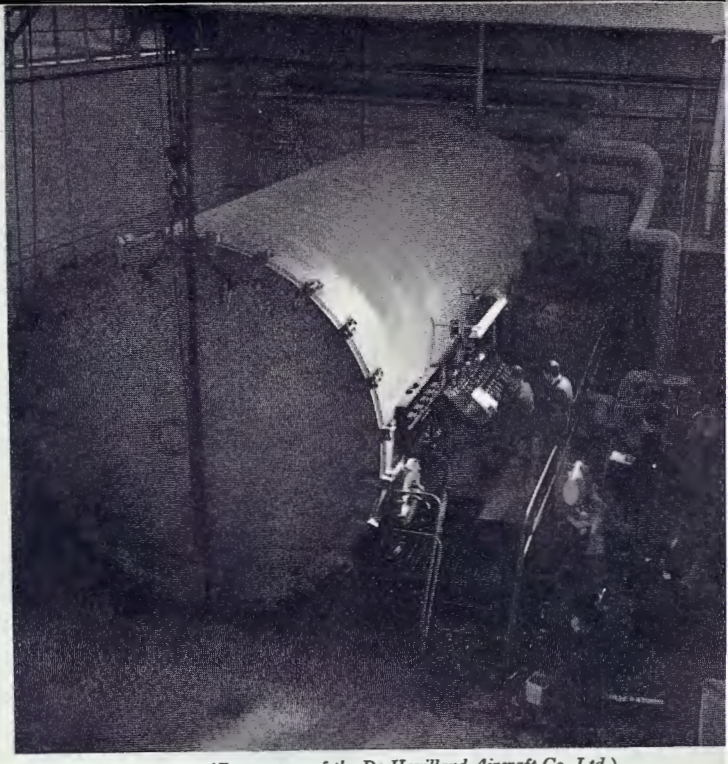
(*By courtesy of Friern Manor Caterers Ltd.*)

Large growers of flowers in places such as the Scilly Isles are now showing interest in 'Drikold' as a means of keeping cut blooms fresh for distant markets.

With the aid of liquefiers, 'Drikold' can be converted into carbon dioxide gas of high purity. In this form it is used in brewery bottling departments for carbonating beer and moving it from place to place. Mineral water manufacturers also use 'Drikold' in the form of carbon dioxide gas to put the fizz into their beverages.



Engineers inside and outside I.C.I. use 'Drikold' for a variety of engineering applications, and it is now a well-known aid in the shrink fitting of machine parts both for the assembly of new equipment and in repair work. An outstanding example, described in the Magazine *last May, was the fitting of two large bushes and a heavy cylinder into the entablature of a 2250-ton forging press.*



(*By courtesy of the De Havilland Aircraft Co. Ltd.*)

Flying conditions at high altitudes make imperative the most rigorous tests on modern aircraft. So that knowledge shall be the most accurate obtainable by factory methods huge vessels have been constructed to take a complete aeroplane fuselage for test. In these decompression chambers rarefied air is brought to a very low temperature by the use of 'Drikold' and the response of the aircraft observed.

The versatility of 'Drikold' is illustrated, in contrast, by such giants of the air as the new Bristol "Brabazon." Aircraft constructors use 'Drikold' to store duralumin and similar rivets which would become too hard to work unless kept at a low temperature.

(*By courtesy of the Bristol Aeroplane Co. Ltd.*)

The clerk of the weather has found a possible rival. I.C.I. recently collaborated with meteorologists in experiments in rain-making by providing 'Drikold' for sprinkling into suitable cloud formations over Tees-side. Similar tactics have been successfully employed by authorities in several countries.

(Crown copyright by courtesy of the Air Ministry)

(By courtesy of London Film Productions Ltd.)

Film companies find 'Drikold' most useful for producing atmospheric effects as they are wanted. Sir Alexander Korda's London Film Studios used it to make the fog on the marshes in Bonnie Prince Charlie, *when Prince Charles (David Niven) and his Highland army were guided by a shepherd towards the English camp at Prestonpans.*

A bit of Home-fed

By P. I. Smith (Plastics Division)

Not everyone in I.C.I. has the space or perhaps the inclination to keep pigs. But the following article by Mr. P. I. Smith, Magazine correspondent for Plastics Division, illustrated by pictures from other I.C.I. pig-keepers, suggests that it is a hobby which is both attractive and profitable.

Mr. Smith joined the Company in 1946 as Publicity Officer for his Division after war service as a captain in the infantry. He is the author of several books and articles on plastics.

It was during the war that my family first began to take an interest in pig-keeping. While I was in the Army my wife was persuaded by some neighbouring farmers to become secretary of the local pig club in the North Staffordshire village where she was then living. She agreed to do so with much reluctance and trepidation, but it was not long before she decided to keep a pig of her own. With the help of our son, then aged nine, and daughter of twelve she reared Bill, a Middle White hog. This first adventure in pig-keeping was great fun and the two children took their duties as farmhands very seriously, cleaning out the sty and giving Bill a clean bed of straw when they returned from school every day.

Bill was a lively and entertaining pig. One of his disconcerting tricks was to follow round whoever was cleaning out the sty and then suddenly to lie down on the broomhead. It was sometimes very difficult to push him away, and on at least two occasions he snapped the stick of the brush in half like a rotten carrot.

It was not until we moved from Staffordshire to Essex in 1947 that I became the active pig-keeper of the family. My first pig was an eight-weeks-old Essex Saddleback gilt—gilt being the name for a young female. The only reason why I bought a gilt instead of a hog, which is always reckoned to be the "better buy," was that our pig club had bought a complete litter, and as it turned out I had the last of eight. Actually there is no difference in the price of a gilt and a hog, but most farmers seem to prefer the latter as it fattens more quickly and, being a male, is naturally more contented. I paid 70s. for Sally, and it was the best 70s. I ever spent. She grew to be a fine pig and scaled fourteen stone at nine months old.

I converted an old potting shed into a pig-sty and provided it with an outside yard. Fortunately the walls and floor were made of concrete and in excellent condition. After a few days heavy "navvying" I had as good a sty as anyone could wish for. Its dimensions were just about right; the sleeping pen was 9½ feet square and 5½ feet high, the outside yard being about 10 feet square with walls 4 feet high.

In the sleeping quarters I put down a rough wooden platform made from an old house door to which I fixed wooden blocks so that it was raised about four inches from the floor. Pigs are sensitive to draughts and need to be kept perfectly dry and warm. Warmth not only reduces the risk of disease following a chill, but it is also necessary if the pig is to thrive and fatten and not use up some of its food to keep itself warm instead of turning it into meat.

When planning the sty it is as well to build it at least a hundred feet from the house. According to the

The author believes in ample feeding

The pig club run by employees of I.C. (Pharmaceuticals) Ltd. is an example of how a group of people can make a success of pig-keeping. With its membership of about 70, this club, which started less than two years ago, has already bought 28 pigs from local farmers, reared and sold 10 to the Ministry of Food, and provided 7 (1325 lb.) for their own canteens. They slaughter on the premises, where they also cure their own bacon and ham. Expert advice on the care of pigs is given by Mr. Ogilvie and Mr. Harrow of the I.C. (Pharmaceutical)'s Veterinary Department.

(Photos by G. Werts)

Model Building Laws issued by the Ministry of Health in 1937, which usually form the basis of local regulations, pigs should not be kept within a hundred feet of a dwelling house unless maintained in a "cleanly and wholesome" condition, but so far no one has been able to define what is meant by "cleanly and wholesome." During the war the Defence Regulations removed these restrictions on pig-keeping, and although they have not yet been withdrawn there is some talk of this happening this year. In any case, if a permanent sty is built it is usually necessary to obtain sanction from the local authority.

The sty must be very sturdy, for a pig is enormously strong and can, if it pushes really hard, knock down quite a respectable brick wall. The yard gate should be made of strong timber and provided with heavy hinges and a heavy bolt fitted—not at the usual hand height, but low down where the strain is greatest. It is a very wise precaution to design the gate so that it opens inwards, for there is then no risk that the pig will break it down merely by leaning against it. Most pigs soon learn to set their snouts under the door and try to throw it upwards. To overcome this the door should be made so that it cannot be pushed off its hinges. A further precaution is to fit a horizontal stop along the bottom and inside of the gate. The boarding should be vertical with the supporting framework on the outside, as this leaves very little purchase for the pig's snout.

The first gate I fitted to the yard of the sty was prised off its hinges when Sally was six months old. She had the run of the garden for two hours before being rounded up and returned unrepentant to her sty. It happened one afternoon when my wife was alone in the house. Sally gave several loud squeals of joy followed by many grunts, and this made my wife realise that something unusual was happening outside. When she went to investigate it was to see Sally careering round the garden kicking her feet delightedly into the air, throwing up clods of earth and obviously revelling in her freedom. At first my wife only laughed, but then the pitiful state of the garden turned amusement into alarm. The lawn looked as if a mole plough had been run up and down it several times, our three young Cordon apple trees were broken, and the kitchen garden was littered with cabbages, lettuce, and the remains of some very promising rows of peas and runner beans. I reckoned that the damage caused by Sally's search for freedom cost me about 60s., not to mention the extra work involved in tidying up the garden and mending the gate.

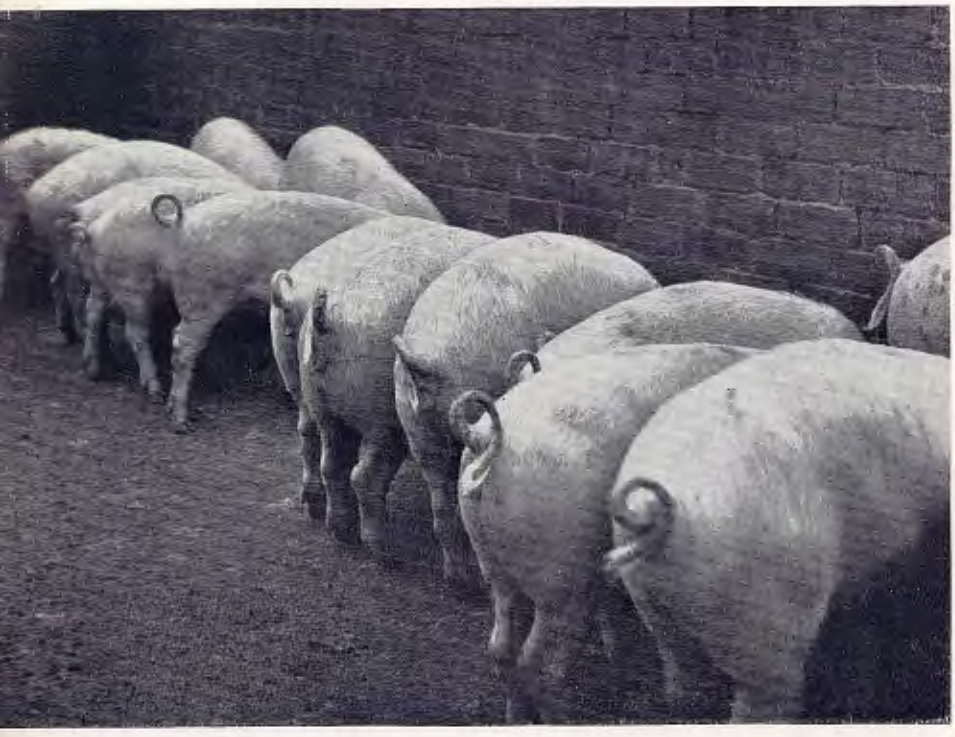
The chief interest in a pig's life is food, and a successful pig-keeper must not only know when and how to feed, but the quantity and variety best suited for any age of animal. A weaner pig about 8–10 weeks old and weighing 25–35 lb. requires about $2\frac{1}{2}$ lb. of food a day, whereas a pig weighing 140 lb. needs 14 lb. a day. An active or pig-keeping member of a pig club is allowed 70 lb. of meal a month, irrespective of the number of pigs kept. This meal is sufficient for a 10–12-week-old animal but quite inadequate for a three-month-old pig. It is necessary, therefore, to supplement the meal with other foods, such as potatoes, cabbage, Belgian carrots, kitchen scraps, canteen waste, grass clippings, apples, and off-the-ration food like bakers' waste, biscuit waste and Tottenham pudding.

Young pigs need fairly concentrated foods, whereas older ones can take bulkier meals. I have found that a pig weighing 140 lb. thrives on a diet of 2 lb. of meal and

a mixture of 10 lb. of boiled potatoes and 2 lb. of swill made up of kitchen scraps and canteen waste, the whole lot being mashed up together with a little water and served either cold or lukewarm. Kitchen scraps and canteen waste must be carefully examined to ensure that no fish or meat bones, broken glass or bits of metal are present, and food of this kind has to be boiled before use.

Young pigs up to about ten weeks old should be fed three times a day, that is, morning, noon and evening. Later on, when the pig scales about 100 lb., it can get along quite nicely on two feeds a day. If a pig does not clean up its rations the chances are that it is receiving too much, and the amount must be cut down to avoid waste. On the other hand, if the pig is not getting enough food it soon begins to grunt its protest.

The pig is a creature of habit, and to keep it contented and thriving it must be fed at regular intervals. If I was even so much as a quarter of an hour late in feeding Sally she would let the fact be known, first by a series of angry grunts and then by picking up the trough with her snout and banging it down on the ground with a fearful clatter. Even when I did turn up to feed her on time, Sally would often overturn the trough or try and push the bucket over in her eagerness to get at the contents.



Most people who fatten a couple of pigs a year find Wessex Large Whites or Wessex Saddlebacks very good "doers".

But she had other and less orthodox tastes. Fountain pens, for example, seemed to have great relish. Once when I was leaning over the sty trying to scratch her back my new Parker pen dropped out of my waistcoat pocket into the sty. Before I could open the gate Sally had crunched it to fragments, and all that I could ever find was the broken gold nib.

If a pig goes off its food and shows other obvious signs of ailing, don't hesitate to call in the vet. It may be nothing much, but on the other hand it might quite easily be the beginning of swine fever, erysipelas or one of the many ills common to pigs. I well remember the day I saw Sally, then 13 stone and only a few days before being killed, covered in spots. She seemed to be in quite good form, but I knew that erysipelas generally started with spots and I was very worried. I ran back into the house to ring up the vet, but before doing so I consulted my wife. She scoffed at the idea of Sally being ill, and so both of us went back to the sty. Much to my immediate discomfort, but eventual relief, we found the pig completely free from spots and placidly eating a large cabbage. It was some little time before I found out that what I had taken to be spots were actually marks left by large raindrops on the white warm skin, stretched tight over Sally's fat body.

A pig's life, though happy, is necessarily short—unless, of course, it manages to worm its way into the family affections as a kind of extra-mural household pet, when its despatch becomes a rather melancholy affair gently postponed until appetite finally gets the better of sentiment. An ordinary pig—respected but not loved—

should be in prime condition and ready for killing after about nine months, when it should weigh something like 14 stone. October and November are the best months for killing because curing of the bacon can then be completed before Christmas.

For curing sides of bacon and hams there are a number of excellent recipes, but if you don't want to be bothered with home curing you can send the meat away to the bacon factory for smoke curing. The method we found successful has the added virtue of being very simple. First of all we weighed the meat and then measured out one-tenth of its weight in salt and one-fortieth of this again in saltpetre. Thus, for 100 lb. of meat to be cured, we used 10 lb. of block salt and 4 oz. of saltpetre, the latter being mixed in very thoroughly. Before salting it is a good practice to cleanse or purge the fresh meat with a strong brine made by dissolving 13 lb. of salt and 4 oz. of saltpetre in 5 gallons of water.

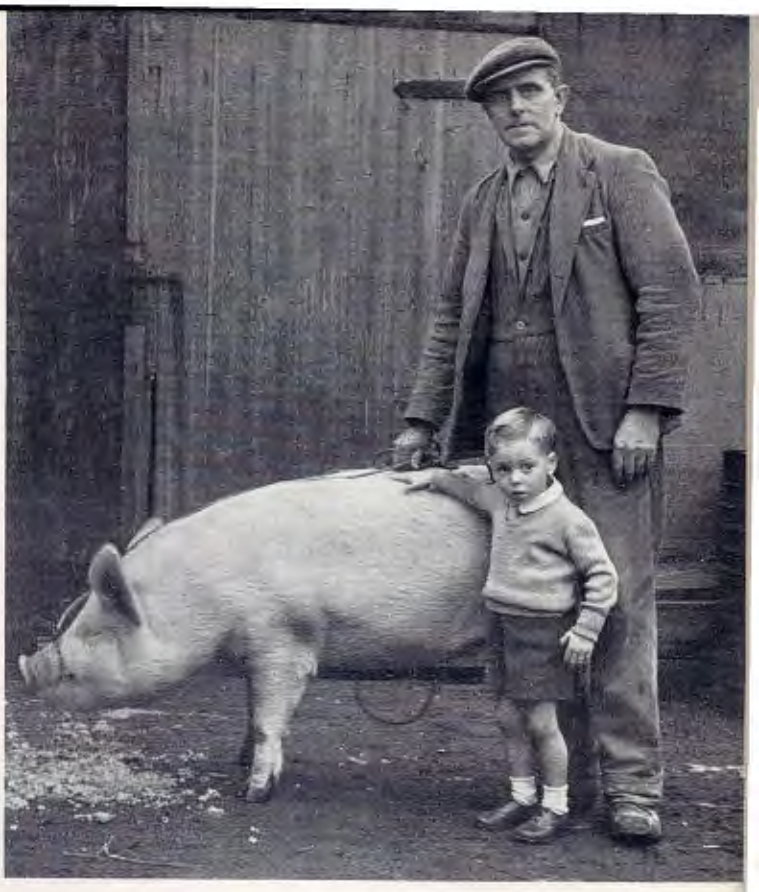
After the cleansing brine has drained from the cuts or pieces of meat, they should be rubbed thoroughly on the skin side with one-third of the curing mixture, taking care to use rather more of the cure for thick cuts, such as the ham and collar.

The next step is to prepare a bed of salt about two inches thick and to press each cut into it, skin side downwards. The cuts are then sprinkled lightly with the second third of the curing mixture, according to their thickness. All the cuts are then entirely covered over with one to two inches of salt, the salt being tightly packed at the sides. After five days the packs should be broken down and any discoloured salt replaced with some of the remaining fresh salt.

Different parts of the carcass need different lengths of cure, time being generally measured according to thickness. We have always found that hams need about six to seven days per inch of thickness and bacon from five to eight days per inch. After curing, the hams and sides of bacon should be hung up and allowed to drain for two to four weeks, then dried out by hanging in a passage or room where the temperature is about 60° and not above 70° F. As drying proceeds, a white surface layer of crystalline salt appears.

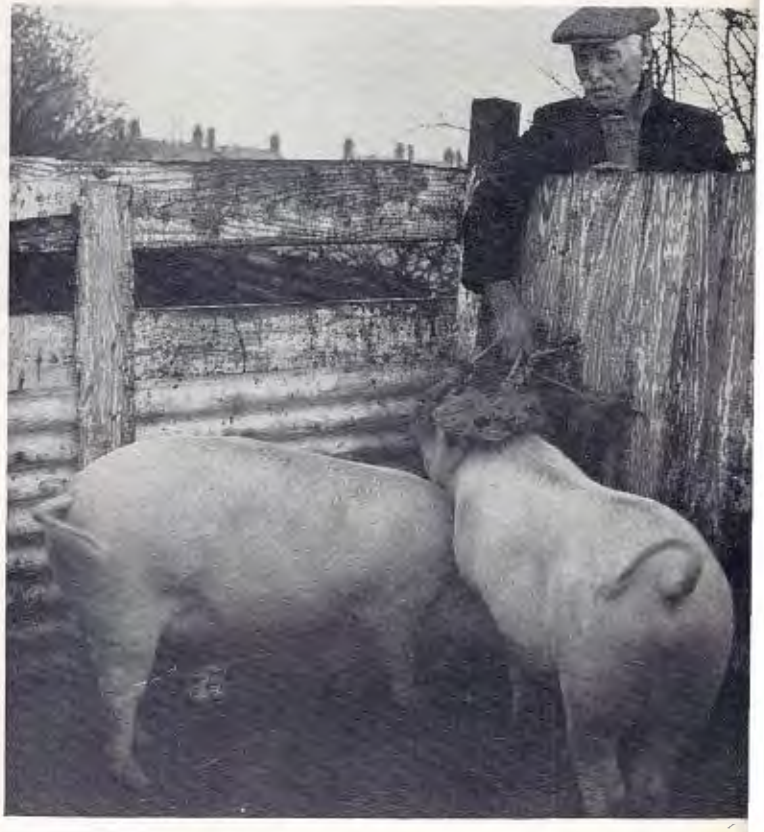
Well-cured bacon and hams should be stored by hanging them up in clean linen or calico bags which have been limewashed two or three times. The meat will then keep at least six to nine months, and once you have tasted home-cured bacon and ham and cut into a genuine pork pie you will never be satisfied until you start to keep a pig yourself.

Apart from these more material gains of pig-keeping, and one should not minimise them, there is a good deal of entertainment—not to mention hard work—in the game. Anyway, personally, I like pigs.



Mr. W. Burgess, lorry-driver at Lostock Works, keeps both Whites and Saddlebacks. The youngster, too, seems to be showing promise as a pig fancier

Mr. Tom Hough, pensioner, Middlewich, was quite sure of a "bit of crackling" for Christmas and is probably thinking of apple sauce, sage and onions



Mr. Sam Downing of Middlewich believes in keeping more than a couple at a time

(Photos of Alkali Division pig-keepers by W. J. Jackson)

INFORMATION NOTES

THE ROLE OF I.C.I. IN THE TREATMENT OF DISEASE

Extracts from an address by Dr. L. B. Wevill, Imperial Chemical (Pharmaceuticals) Ltd., to the Central Council at Blackpool on 18th November, 1949.

IT is not uncommon in my experience for people to come up to me and say: "What is I.C.I. doing about this? Why does not I.C.I. produce a cure for warts or for the common cold?" It is doubtless very flattering, this mark of the public belief in I.C.I.'s capacity to work miracles; but it does suggest, perhaps, a lack of information on what we are trying to do, of the resources that we have, and the inevitable limitations that there are on our activities.

Our aim is a perfectly simple one. We are trying to devise new drugs for the treatment of disease, whether of animals or of human beings. I hardly need to stress the importance to the community of this work. There are still plenty of diseases that the medical profession treats ineffectually, or sometimes not at all. There is still a sad loss in badly needed foodstuffs throughout the world from diseases of animals.

The essential tool for the development of new drugs is organic chemistry, and where in Great Britain would you find gathered together in one organisation a brighter galaxy of organic chemical stars than in I.C.I.? In other words, the means to attack this problem, or at least the major part of those means, were already to hand. It seems only a logical development, therefore, that I.C.I. should turn some of these vast resources to the problems of medical research.

We do labour under a good many difficulties which, perhaps, are not quite apparent to anybody who is not actually concerned with this field. One difficulty we have is in ascertaining the results of our activities. We must know, in the first place, what is the probable outcome of any disease left to itself; and then, when we apply a new remedy, we must apply it to a sufficient number of people to get a significant statistical result, and that takes time.

One of the most exasperating types of disease to deal with is the type that can, apparently, "go to earth" for a longer or shorter time and then come popping out again. There are many conditions in which what we call in our jargon "natural remission" is quite common. You will appreciate that if you are working on a disease which may have a natural remission of five years, it is going to take you at least six or seven years before you can test the efficacy of your remedy, because you will judge of it not by the immediate recovery of the patient, which might have occurred anyway, but you will have to sit back and wait and see whether it comes popping up again or not.

To achieve the best results we must select our targets and harness our resources in quite specialised ways, concentrating on those things which we can do well, and lending what help and assistance we can to people who have other resources to exploit.

Those are, broadly, the lines upon which the Research Department has worked up to date. There is another side of their activities, which is no less important; we cannot be content, or rest content, with the tools, that is to say the experimental techniques, which we find ready made for us; so, at the same time, quite a large amount of our energies and activities is devoted to trying to devise new techniques which will enable us either to tackle old problems rather better or to attack new problems which hitherto we have not done anything about.

Now, up to date, the rate of progress has been one, I think, of which any company may well be proud. We have made our mark in the field of malaria research; we have produced a drug with which some of you are familiar, called Paludrine. Remember that no drug stays in the Pharmacopoeia for ever. What will be the ultimate fate of Paludrine I do not know, but I can guess: in time it will be superseded by something very much better. But I am quite sure that Paludrine will always remain in the textbooks because it represents something of permanent interest and permanent value in chemical research. It has shown biological activity in an entirely new group of compounds, and that is most important, because those biological activities may be developed ultimately in quite different directions.

In the penicillin field we can hold our heads proudly and say: "We owe nothing to any man." Our penicillin process is our own. We have recently made what may well prove to be an important incursion in the veterinary field in an attempt to control the disease which makes large areas of Africa, in particular, quite unsuited for the raising of cattle because they just cannot survive the ravages of the biting fly that spreads this disease. It is early days yet to say whether our hopes will be realised fully.

There are other less spectacular and perhaps less important contributions that we have made in the medical field. We have chased the humble louse to some effect with drugs like 'Loricide'; we have attacked the scabies mite, which, though it will not kill you, can make your life singularly uncomfortable, as some of you may possibly remember from army days.

We have produced a rather fascinating anaesthetic for the horse. Perhaps it may not strike some of you that the horse is a rather formidable animal to anaesthetise. You must anaesthetise him on his feet, in which case he goes down with an awful bump which does not do him much good, or you must put him down first, and, being an obstinate creature, unless he has come out of a circus he will not always lie down on demand. Well, we have produced a gentlemanly drug which you can inject into the horse and he goes on the ground and stays there without moving a muscle, and when he feels better again he just gets up quietly and walks away.

There are other fields in which we are working hard but in which we may have to wait some long time yet before we can hope for tangible results. There are only a few of you, I think, who have not heard of viruses; don't ask me what they are, because the experts still argue hotly. One thing I do know is that they are responsible for an array of quite abominable diseases, starting with the cold in the head and influenza and going on to horrible diseases like infantile paralysis. When so little fundamental is known about these little creatures it is only reasonable to expect that we are not going to find the cure for them overnight.

Tuberculosis is another disease in which we are intensely interested, and it is a curious thing that the causal organism of tuberculosis has been known for something like sixty years and yet we still cannot effectively and quickly cure this tiresome disease. Inevitably, and rightly, we are working, too, on the equally baffling problem of tumours.

I suppose it must be a mixture of obstinacy and optimism which keeps the research workers with their noses to the grindstone on these long-term projects where there are so infinitely many disappointments and where, in some cases, the ultimate goal seems just as difficult of attainment as ever.

LONG SERVICE AWARDS: HOW OLD HANDS CAN HELP THE NEW

MANY of us remember from schooldays the lost and lonely feeling of the "new boy." Plunged into the whirl of school life, the newcomer feels at first completely out of things; the others mean well but are engrossed in their own activities among their own friends. And so the new boy remains shyly apart, until one day some friendly classmate, remembering perhaps his own first term, makes that gesture of comradeship and help which marks the beginning of a new life among new friends.

It is the same in many walks of life, not least in industry. We are apt to forget sometimes that there are many "new boys" always coming into I.C.I. and that they share in some measure the feelings of the youngster going for the first time to a new school, the soldier or airman posted to a new unit, or the sailor to his first ship.

The importance of giving a friendly word and a helping hand to the newcomer was emphasised by Mr. J. L. S. Steel, Overseas and Development Director of I.C.I., in a short address when presenting Long Service Awards recently at Metals Division. After some personal reminiscences of his early career with Brunner, Mond and Co. Mr. Steel went on:

"I shall always remember the kindness and encouragement I received in those early days. They gave me a start which I could never have had if I had moved into a crowd of people who were not anxious to see the new and young employee 'find his feet.' I would like to suggest to you, who all have twenty or more years' service, that one of the ways in which you can mark your long service with the Company would be to make a special effort to help those who start their industrial lives in this Company. In a sense it is quite a simple thing to do. It means, perhaps, showing just a little kindness or speaking an encouraging word, but that gives a very great pleasure to a man or woman who is just starting in a huge and perhaps seemingly rather inhuman organisation. The last thing in the world we want is to kill enthusiasm. Most people start enthusiastically, and we want them to keep that enthusiasm right through their working life.

"You in this room realise as well as anyone the value of long service. It is impossible for anyone to go into a job and to be absolutely first class at it at once. You have to learn your way about, and to build up this great tradition of craftsmanship. If you can do anything, as I am sure you can, to help in encouraging other people not to wander about but to stick to their jobs and really make an effort, you will help them not only to enjoy their work but to make a real contribution to the prosperity of the country."

THE MAINTENANCE ENGINEER

By T. C. Robinson, Products Works Engineer, Billingham Division

IN these days of concentration on new capital projects without loss of production from existing plants the job of the maintenance engineer is no light one. He is far removed from the repair gang boss of more leisurely days, and the mode of this transformation is worth a moment's consideration. Formerly, the millwright squad of production engineering shops was paid a higher basic wage than other craftsmen but did not participate in piecework rates and had to do its work when plant and machinery were available—frequently at week-ends. The introduction of continuous working over a seven-day week presented quite new problems to the maintenance staff.

In part at least of the heavy chemical industry the original trend was towards the provision of spare plant and machinery—installed but not working in the case of the larger items, readily available as a replacement in the case of smaller parts. In course of time it became evident that such spares were not only expensive examples of idle capital but themselves provided a problem in maintenance, as deterioration sometimes occurred more rapidly with the standing than with the operating machine.

During this period there was also a continuous leaning towards increased production from existing plant and a desire to incorporate in the operating schedule as much available machinery as possible for as much time as possible. Intensive production of this nature led to decreased maintenance cost per unit of production, but only too frequently this was followed by extensive, if long-term, repair rather than maintenance in the stricter sense. Some compromise, therefore, had to be found along the lines of what has been called "preventive maintenance."

The aim of this policy was to prevent the necessity for repair in the breakdown sense so that operating staffs could plan their production programmes for months ahead, with the certainty that plant of the necessary capacity would be available. The price to be paid for this security was co-operation with maintenance staff in the release from production of each unit of plant for short inspection periods, in which troubles could be determined at an early stage while their correction was still a relatively simple matter. At this stage of reorganisation the maintenance engineer had clearly travelled some distance along the path from quick-witted plumber to the honours graduate of today.

That much expert craftsmanship went into emergency repairs and other more definitely scheduled overhauls cannot be gainsaid; but the circumstances in which the work was carried out too often prevented the achievement of a standard which was both desirable and practicable. The modern programme calls for no less skill in diagnosis—not of a fault which *has* developed but of one which *will*—but the aim is to effect the adjustment or replacement under controlled conditions with adequate supervision.

In the application of such a policy to a plant making one of the industrial acids or an artificial fertilizer on a large scale it is necessary to schedule each machine, each vessel, each structure—in effect, each unit of plant or building—and to determine a period over which it may be expected to run at reasonable efficiency or to maintain adequate strength against corrosive attack. These periods between inspection may vary from one week to five years, but will in general be between three months and one year, and it is on the basis of an annual programme for the following year that operating forecasts of production should be based. The basic problem is simple: to reduce actual maintenance costs without impairing efficiency, and to increase availability of plant, thereby still further reducing maintenance cost per ton of product.

The successful maintenance engineer must not only be aware of the general principles of the manufacturing process but of the details of the method of actual operation. To this knowledge and his own technical equipment he must harness the skill of his men and the materials in the manipulation of which they are trained. Systematic organisation is essential, so that the maximum maintenance use is made of non-productive machine time. Any tendency to be too rigid should be countered by remembering the gibe that a training in logic enables one to do the absurd with confidence.

Among the general problems to which he must apply *workable* solutions at many different points are lubrication in all its aspects; alignment, from pump shafts to ten-foot diameter rotating kilns two hundred feet long to be kept "floating" at a given slope on five pairs of rollers while handling loads varying in amount and distribution, at temperatures up to 1500° C.; power conservation, from prevention of steam leaks to design of driving machinery for conveying and elevating corrosive solids or agitating and pumping fluids reluctant to remain in that phase; perhaps most important of all, the choice of materials of construction suitable for particular conditions.

He is, in fact, the prototype of that technologist on whose training so much thought has recently been lavished. But he is also a man with a fascinating and exciting job, who sees at first hand the effect of applying his ideas to his plant.

SAFETY EXPLOSIVES

'Unibel,' first of a new series of Nobel Division's safety explosives for use in gassy mines, has successfully passed the statutory tests for permitted explosives required by the Ministry of Fuel and Power. Further, it is the first unsheathed explosive to be certified as equivalent in safety to a sheathed permitted explosive. The following note, contributed by Nobel Division, explains something of the development of safety explosives, which have enormously reduced the hazards of underground coal mining.

A HUNDRED years ago, the only explosive available for use in coal-mining was gunpowder, which exploded by burning at a high speed and produced a bright hot flame. This flame was certain to ignite any atmosphere rich in firedamp (methane) or coal dust, and it is not surprising that accidents in the pits were frequent.

Then Alfred Nobel began manufacturing nitroglycerine, and a new era in rock blasting technique opened; his invention of dynamite and blasting gelatine gave the miner another type of explosive which detonated at a very high speed. Experience must have shown that these detonating explosives were safer than blackpowder, for slowly they replaced it in all gassy and dusty mines.

By 1886, when the first Royal Commission on accidents in mines drew up their Report, it was clear that detonating explosives were much safer than blackpowder; but it was also obvious that the danger of ignition was still very real unless great precautions were taken in the preparation of each shot. The gas from the detonation was still too hot, and safety could only be obtained if this gas was cooled before it met any inflammable atmosphere.

At first, the lining of shotholes with wet moss was recommended, but the virile explosives industry soon developed an improved technique. It mixed so-called "coolers" in the detonating explosives. These were salts, like Epsom salt, borax, and common kitchen salt. Gas and dust ignitions then became so infrequent that it was no longer possible to judge the safety of an explosive on general experience. Expensive apparatus was therefore built to test the safety of explosives fired under dangerous conditions in a very rich firedamp mixture.

The way was now clear for the development of safer explosives and for the improvement of the methods of assessing safety. In 1929 the present British official gallery test was introduced, and all the safety explosives which are now fired in gassy or dusty mines must pass this severe test and so become "permitted" explosives. The production of permitted explosives represents a major triumph of the explosives technologist—a triumph by which he has rendered a great service to the miner and has made possible a very large output with a high degree of safety.

When permitted explosives had been adopted in all pits where there was any danger of ignition of gas or dust, the number of accidents from this cause fell to a very low figure. Yet there were still occasional ignitions. In 1934 there were ten reported ignitions—about one in every four million shots. Most of the ignitions took place in pits where breaks in the coal seams were liable to contain pockets of gas. It had already been shown that permitted explosives could be made even safer by surrounding each cartridge with a thin layer or sheath of cooling salt. So the "safety sheath" was put on all explosives which were to be used in particularly dangerous pits. The salt found to be most effective was bicarbonate of soda and today this material is used both as a powder sheath and as a felt wrapping. The felt is a mixture of bicarbonate and cellulose, pulped into a wrapping material which looks like soft cardboard.

The results with sheathed explosives were at first remarkable. For two years there were no ignitions attributed to sheathed explosives, and many people confidently believed that the danger of gas and dust ignitions had been eliminated for all time. But, unfortunately, longer experience showed that although they were reduced in number a few ignitions still occurred.

Sheathed explosives have one obvious disadvantage: the sheath and the explosive charge can be separated. In loading a charge in a rough borehole, for instance, separation of the cartridge from its sheath is possible. This risk could be avoided if the sheath was incorporated uniformly *within* the explosive. Carefully planned research revealed how this could be done without increasing the danger of ignition. The result has been the production of a new type of safety explosive, the EqS (Equivalent to Sheathed), and the first of these is now in use. It is known as 'Unibel,' because the explosive and sheath have become one unit.

It is too early to make any statement on the safety of 'Unibel' in actual practice, but it is hoped that it represents a new milestone in the progress of increasing safety in the coal-mines of Britain.

I.C.I. OVERSEAS: THE SUDAN

A branch of Imperial Chemical Industries (Egypt) S.A. has been operating in the Sudan for more than ten years, but recently the Sudan office at Khartoum was established as a separate organisation under the name of Imperial Chemical Industries (Sudan) Ltd. In the following note Mr. G. Lillywhite, manager of the company in the Sudan, gives some facts about this vast and important African territory.

THE name is Arabic for the country of the blacks, and the territory is the largest governmental unit in Africa. With its 967,500 square miles it is as big as the United Kingdom, France, Belgium, Norway, Sweden, Denmark, Italy, Spain and Portugal put together. Like a colossus it sprawls over North Central Africa; a hotch-potch of races, climates and beliefs.

The Anglo-Egyptian Sudan, as it should properly be called, is a condominium. This is the result of an agreement entered into by the Governments of Great Britain and Egypt after the Sudan had been reconquered by forces under the command of General Kitchener. That was over fifty years ago, and ever since that date the British and Egyptian flags have flown side by side in the Sudan. The son of the Mahdi, Sir Abel Rahman El Mahdi Pasha, is honoured by both the condomini, a fact which provides convincing evidence that, given a measure of good will, old antagonists can unite and work towards a common goal.

North to south in a direct line is about 1200 miles, and east to west the lands of the Sudan stretch for 1000 miles. It is bordered by eight territories: Egypt and Libya in the north, French Equatorial Africa in the west, the Belgian Congo, Uganda Protectorate and Kenya Colony in the south, and Abyssinia and Eritrea in the east. The population is known to be over 7,000,000, and with better living conditions is expanding rapidly. At the time of the battle of Omdurman the northern half of the country was almost depopulated by war, and its aftermath of famine and disease.

In the north of the Sudan, which is a desert steppe, the inhabitants are dark-skinned Arabic-speaking Moslems. In the southern half of the country live the black negroid types, comprising one-third of the population. Many are pagans, and speak Central African languages. The vegetation in their area is tropical.

Dominating the entire country is the White Nile, flowing south to north, and its course from Nimule on the Uganda frontier to Wadi Halfa on the Egyptian border extends for over two thousand miles. It would be well to note that if the White Nile was suddenly to dry up, or to be diverted elsewhere, millions of Sudanese would perish, and so would the great majority of Egyptians.

The principal types of dwellings used by the Sudanese are either flat-roofed, mud-coloured and built of baked brick, or circular huts of grass or mud with thatched conical roofs.

There is no shortage of land. The settled cultivator with three to five acres grows millet, beans, groundnuts, onions, melons and pulses, while the negro in the south grows in addition sweet potatoes and tapioca. The nomad, as in Biblical times, possesses only his herds of cattle, sheep, goats and, not least, his camels.

Life in the southern Sudan is far less sophisticated than in the north. Economic development has been slower, and the inhabitants are largely primitive. Most southern tribesmen carry spears as a protection against wild animals, and some use bows and arrows. Elephant, lion, rhinoceros, giant eland, buffalo, giraffe, zebra and gazelle live in the plains, swamps and forests of that area, while the upper reaches of the Nile swarm with crocodile and hippopotamus.

Although the Sudan is not, and never will be, an industrial country, one can enjoy in Khartoum, the capital, and Omdurman all the amenities which are usual in Europe, and the Sudanese have taken to the use of the aeroplane, train, tram, bus and taxi as to the manner born. Light industries are being expanded as the needs of the country grow, but the present prosperity of the Sudan and its future development are entirely dependent upon its agricultural and pastoral exploitation.

The Sudan is the original home of Egyptian cotton, which is by far the most important crop of commercial significance. A long staple type is grown on irrigated lands, and American cotton on rainlands.

The Gezira, which is the Arabic name for island, is a plain of about five million acres. It lies between the Blue and White Niles, south of Khartoum, and is artificially irrigated by means of a dam across the Blue Nile at Sennar, which together with the wonderful canal system was completed by the Sudan Government in 1925 at a cost of £13,000,000.

The Gezira is the economic backbone of the Sudan. A million acres are under irrigation, and roughly four hundred thousand acres are annually under long staple cotton, millet, fodder, wheat and vegetables. All the raw cotton is exported, much of it to Great Britain, and with the proceeds the Sudan is able to purchase those necessities of life which can only be obtained from overseas. Some Sudan cotton returns in the form of cotton materials, but at the moment this must be so, as there are no textile mills in the country.

The cotton is grown by tenant farmers, who receive 40% of the profits, while a further 20% goes to the Plantations Syndicate, whose function is to provide the management, supervise the planting and gin the cotton. The remaining 40% of the profits made on the sale of cotton goes to the Government, who provide scientific research at the well-known Wad Medani Research Station, and who financed the building of the Sennar dam and canals, and are responsible for their maintenance.

In 1950 the Government and farmers will be the only partners in the Gezira Scheme, when the Syndicate will be bought out and the scheme placed under national control. The Gezira Cotton Scheme is unique. Not only is it one of the very few large-scale developments in Africa, it is also unique in its sociological and economic approach. After over a quarter of a century of working it stands as a monument to compromise and adaptation. Fifty years ago the inhabitants of the Gezira were backward and primitive; today they are members of a vast partnership. They have been merged, retaining their traditional way of life, into a modern agricultural enterprise. While whole families still play their traditional role in the fields, the value and necessity of modern management and scientific aids are fully appreciated. In this respect the immense reserves of experience and scientific knowledge possessed by I.C.I. are at the disposal of the Sudan authorities, and no happier example of this combination of governmental and commercial co-operation can be put forward than the introduction of 'Antrycide.' This drug may well make large areas of the Sudan suitable in time for cattle-raising, with resultant advantages to the economy of the country. Much of the field work on this new drug was done in the Sudan, with the enthusiastic co-operation of the Sudan authorities.

The problems facing African territories such as the Sudan are truly immense. There is the necessity for freeing the countries from disease, and at the same time to ensure that enough food is grown to feed the resultant increase in population. There is the need to harness the immense potential resources of Africa to the economy and well-being of the rest of the world, but at the same time to ensure that the African himself maintains his elemental dignity and is not submerged in a system alien to his natural aptitudes.

TRADE WITH SCANDINAVIA: I.C.I.'s IMPROVED PROSPECTS

Contributed by European Department

THE three Scandinavian countries, Norway, Sweden and Denmark, provide a considerable market for I.C.I.'s products—a market whose importance will increase as the artificial restrictions on trade are relaxed.

Before 1939 this territory was, of course, largely within the German industrial orbit, but after the war the break-up of German industry caused Scandinavia to turn to this country and to the United States for industrial goods not made locally. So far as Norway and Denmark were concerned, this change accorded perfectly with the political attitude of the peoples, in whom a strongly anti-German attitude had been engendered by the military occupation. The same could not be said of Sweden, which, for a variety of reasons, has for generations been much more closely linked with Germany, both economically and culturally.

However, the whole of Scandinavia now shows an unmistakable desire for vigorous trade relations with this country, and its *potential* turnover with I.C.I. is large. Unfortunately it is still necessary to emphasise the word "potential," because the numerous artificial barriers still in force result in a great discrepancy between what would be commercially possible and what is in fact possible in the present unnatural conditions of European trade. However, there has recently been some extensive relaxation of restrictions under the Organisation for European Economic Co-operation scheme, which has greatly helped I.C.I.'s business, notably in the case of exports of dyes to Sweden, and one can, without undue optimism, look forward to a gradual improvement.

Practically all I.C.I. Divisions do business with Scandinavia, and for some of them the turnover is considerable; Metals Division, for instance, have already a turnover of more than half a million pounds. In the absence of restrictions, Dyestuffs Division alone would probably do business to the value of over one million pounds; the turnover in heavy chemicals might well be about the same; and Nobel Division could conceivably exceed £200,000.

In September 1949 the three Scandinavian countries all devalued their currencies in line with sterling, and this has improved I.C.I.'s prospects there, inasmuch as some of our main competitors (Germany, France and Switzerland) have not devalued to the same extent. That the German share in the Scandinavian market will increase is very probable and quite natural; but there is every reason to suppose that the three Scandinavian countries, with their very high standard of life, will provide a permanently important market for British exports, and every effort is being made to ensure that the Company shall participate as fully as possible in their foreign trade.

I.C.I. is represented in Scandinavia by a large number of agents—about fifteen in Denmark, twenty in Sweden, and twelve in Norway, and a liaison office is also maintained in Gothenburg, Sweden. It is the function of this office to keep in constant touch with agents, to mediate where necessary between agents and Divisions, to collect and circulate information of interest about industrial and commercial developments in its territory and, on the strength of its own intimate knowledge of local conditions, to advise I.C.I. on Scandinavian affairs in general.

A BOOK ABOUT FARMING

Mr. Sidney Rogerson, I.C.I.'s Publicity Controller, has written a book entitled Both Sides of the Road, *illustrated by Charles Tunnicliffe, the purpose of which is to stimulate an intelligent interest in and appreciation of British agriculture and, as its title suggests, to enable the reader to understand better what he will see going on upon either side as he drives along the roads of Britain. This book will be of particular interest to I.C.I. readers because of the Company's concern with agricultural matters. Dr. A. Fleck contributes the following review.*

THIS book can be most warmly recommended to readers of this magazine. To those who take an interest in the countryside, believing that their knowledge is broad and general rather than detailed, such a book will be very valuable. It will enable them to get an all-round knowledge of farming operations and to balance up in their minds the various aspects of a farmer's life.

I fancy that the expert farmer would claim to be already informed on most of the matters that are dealt with here, but I can well imagine the average farmer sitting down with this book and enjoying it thoroughly just to brush up his knowledge of the most up-to-date outlook on farming practice and to keep himself abreast of modern views.

It will also, I am sure, appeal to another wide circle of readers, namely those whose work is concerned with manufacturing and business affairs, but who are coming to realise more and more that agriculture is part and parcel of the structure of British industry.

Mr. Rogerson is a writer with a distinctive style. He has a direct approach which stimulates interest and thought, and by way of illustration I would like to quote the following passage from the chapter "A Tribute to the Pig," from which I think you can see that he tells his message in a manner at once direct, realistic, and yet with imagination:

> Even when the farmer keeps pigs for profit instead of to fatten for his own bacon, the pens or houses seem automatically to become a place of rendezvous where the farmer and his friends forgather to smoke their pipes and argue over the weights of the inmates. But then the pig is a peculiar person, unlike any of the other farm animals—except the farmer himself. That is not meant as disparagement of the farmer, but merely a way of saying that the pig is the most human of the domestic animals. What I mean is excellently described by an old saying which I have quoted more than once, that "a dog looks up to you, a cat looks down on you, but a pig looks upon you as another human being." If you ever happen to have anything to do with pigs you will soon learn how true this is—how they cannot resist poking their noses, literally and metaphorically, into anything that is going on, yet with what unconcern they carry themselves.
>
> The poor pig has been reviled down the ages as the embodiment of gluttony and sloth. Of course it is greedy, very greedy. It is this natural greed which enables it, if properly fed, in a very short time to make flesh and fat for pork, bacon and lard. But it is Man who has played on this trait, who has carried out selective breeding to develop it and who keeps his pigs in conditions which encourage them to eat to make weight and denies them normal exercise to work it off.

The illustrations are a definite feature of the book, and both the black and white and the coloured plates are very well worth while. To me, however, the black and white are of the highest order and convey the very spirit of the countryside. Of the colour plates, the ones with cattle have the greatest appeal, and I like, in particular, the one showing Ayrshires at their drinking bowls.

Something must be said of Mr. Rogerson's farming philosophy. He preaches the virtues of farming with the aid of the best knowledge that science and experience can provide and speaks with appreciation of what the National Advisory Service and the Young Farmers' Clubs have done and are achieving. In bringing to bear his critical knowledge he soon makes it very clear that he sees in grass, its cultivation and its conservation, one of the biggest advances that can be made in the technology of the farming industry.

There are one or two places where the reviewer felt a desire to question what Mr. Rogerson was saying. Once he slips up on the geography of a local spot in Scotland, and then he displays an attitude of pessimism when he refers to the permanent damage that mineral workings can do to the agricultural landscape. That is rather surprising when one remembers what has been done by the proper addition of fertilizers and lime to the most unlikely places. The resources of modern technology are great and we should not despair of making the best of both worlds, the use of the mineral resources of our island coupled with the restoration of the land to high agricultural levels.

These criticisms are small in comparison with the great wealth of good and interesting reading provided by the book. It conveys a picture of a live and thriving industry carried on in conditions of development and growth. The picture has all the imprint of being true and accurate. It is one that we in this country have every reason to be proud of; it is stimulating to the general student of social order; it is a challenge to the technologist to work for ever better farming.

*** Both Sides of the Road, *a book about farming by Sidney Rogerson, illustrated by Charles Tunnicliffe.* 183 *pages,* 21*s.* (*Collins*).

FILMS ON TOUR

THAT the I.C.I. Travelling Film Show is a welcome visitor where'er it goes is proved by the summary of attendance figures for the first tour of the 1949–50 season. The total in all Divisions and Regions which the Film Show has visited during the first tour shows that 21,930 people have seen the films *Outing for Christopher* (the story of the Metals Division) and *Man against Insect*.

Altogether 108 performances were given in the tour, in places as far apart as Dundee and Cardiff, Port Clarence and Stowmarket, to audiences ranging from many hundreds in I.C.I.'s bigger factories to smaller but no less representative groups in the more out-of-the-way works. In I.C.I.'s own recreation clubs and canteens, as well as in village halls and city hotels hired for the occasion, the showing of these films has brought together representative gatherings of the Company's employees to see something of how the "other half" works, and of how the products and services of one Division contribute to those of another, as well as how they fit into the complex pattern of British industry.

HIGH-SPEED SERVICE

ON a Friday early in November, Metals Division received an appeal for urgent assistance from the American tanker *Fullerton Hills*, lying at St. Nazaire, France, completely out of commission owing to failure of her condenser tubes. Co-operation between the London and Division Export Metals Sales Departments and Allen Everitt Works resulted in an order for 900 "Æ" Supernickel condenser tubes being placed for rush delivery. These tubes, weighing about two tons in all and each over twelve feet long, had to be specially drawn to the finished size and to undergo individual testing and inspection.

Thanks to the efforts of the works, half the tubes were ready for despatch on the Monday morning. The buyers chartered a special aeroplane from Birmingham airport which took off early on the Monday afternoon on the 350-mile trip to St. Nazaire, and the tubes were being fitted in the tanker's condensers on the Tuesday. The remaining tubes, likewise flown over to France, were in the port before dark on the Wednesday evening. The buyers have expressed their great appreciation of the efforts of all concerned.

DIVIDED WE FALL

By Alfred Stott

How many of us can say offhand how long ago it is since labour first became organised ? Indeed, apart from those actively connected with the trade union movement, few of us know, some of us care little, and the majority of us care not at all. A great many of us pay our contribution of 6d. or 1s. a week to our union, and when we are in trouble at the works state our case in no uncertain manner to our union representative and expect wonders to happen. It is not unknown for workers to withdraw their membership should their particular case be lost, irrespective of its merits.

To be organised as we are today was the life ambition of some of the great trade union leaders of the past. Men have sacrificed themselves and indeed their families for the emancipation of the working man. In those bygone days they had the support of their fellow men. Men who defied the power of the mill owner and the like. Men who where blacklisted as a result of their agitation. Who has not heard of the Tolpuddle Martyrs, or the Chartists ? Most of their ideals are realities today. We can meet the mill owner on equal terms. We have the privilege of sitting at the same table as he, and to disagree with him as much as we choose without victimisation.

The great trade union movement is formed. It does a grand job of work. It is recognised by the government and the employer. But we, as members, can do something more than pay our weekly contribution. We can let the union get on with its job of attending to wages structure and conditions in industry. We, the workers, can meet the management to discuss local factory affairs. We can form our own committees, or, as is well known throughout I.C.I., works councils. We can discuss jointly with the management on equal terms. That in itself is an achievement. To those factories who are outside the Works Council Scheme I would urge that they come into the scheme, and thus relieve the union, so that that body can attend to union business.

Different Position

Haven't we, the workers, seen cartoons and pictures depicting the top-hatted mill owner and mine owner with whip in hand, driving our fathers and grandfathers to the loom and the coal face ? Could our fathers and grandfathers take a day off work and answer to nobody ? Could they turn against their bosses in defiance? If they did these things, then they were out of a job, and blacklisted as well. But today the position is quite different. Are we playing the game by staying at home when we are not ill ? Some of us do these things when we should be at work. In so doing we are helping neither ourselves nor the nation.

Can a reconciliation between Boss and Worker be effected ? If so, how can it be brought about ? Certainly not by fear and suspicion, nor by prejudice, or by conceding nothing. If we, the workers, were prepared to put something into the kitty, that would be an excellent send-off. There may be angry protests at this suggestion, but all of us, no matter who we may be, have to give in order to live. To reconcile Boss and Worker we must form our works council, and see to it that our representatives

are kept up to scratch. Make yourselves a nuisance to them. Complain to them. A good representative will thrive on your complaints. For instance, you may think that the constitution of the works council itself is not truly representative. There may be too few men, or too few women, or too many of one or the other. If you can convince your representative that such is the case, and he gets it on the agenda at the works council meeting, then he's got the complaint brought to the notice of the management, who must do something about it or give a good reason for not doing so. That is only an instance of what can be done through the works council. Views can be aired, and if there is something which to us, as workers, seems absurd, and it is explained by those in authority, then many suspicions can be removed.

A New Age

Then we come to the profit motive. What we really mean is profiteering. There is a tremendous difference between the two. Could any ordinary British workman be content at his job if he was working for a firm that did not make a profit? Does not a worker go to work in order to make a profit? And, surely, we are not living in the age of the profiteers unless it's the men who come at night to raid the worker's poultry shed. Let us get rid of this age-old suspicion, and think of the man at the top who has to make a profit in order to carry on his business. One may feel that workers representatives on works councils are stooges of the company. This is not so, as no good management has the time to waste with yes-men.

There is also a feeling among workers that their representatives on works councils can go only "so far." But they rarely say what they mean. Who knows what may be accomplished by joint consultation? Without it, little can be achieved. With it, there is so much to be gained. To be active, not only bodily but mentally as well, should be the keynote. If every factory in every industry in Britain consulted jointly with the management, and between them sank their differences into a common effort, then we as a nation would be making a step forward.

It is hard for the worker to forget the general strike of 1926 or the means test of the 'thirties. That is unfortunate, as it is a handicap towards our recovery as a nation. We have good cause to remember those unhappy days, and we shudder to think of what may happen in the 'fifties. No man can say what will happen. But if management and worker get together, trust each other, consult each other, work with each other, then maybe we shall reap the fruits of our joint efforts. The gulf is not too great, it can be bridged, with a little good will on both sides. It is no good sitting round a table, intent on getting all or nothing. Both sides can make concessions. There is no Utopia, but we may get something closely approaching it if only we keep on trying. Let us look ahead to an age in which no man shall want. To an age in which employer and worker meet on equal terms in every factory in Britain to thrash out their problems.

Mr. Alfred Stott joined the Company in 1936 as a processman in the Production Department of Nobel Division's Roburite Factory. During the war he served for a time in the Army and after being discharged on medical grounds returned to his work at Roburite, where he takes a keen interest in factory affairs. Mr. Stott is a works councillor and also a shop steward.

PICTURES FROM AFAR

INDIA AND PAKISTAN

Beginning in Bengal, these pictures by Mr. B. R. Goodfellow of India Department, Nobel House, London, are arranged to form a tour round the country via Southern India, North-west Pakistan and into the Hills. This first instalment takes us as far as Madras. In a subsequent issue the tour will be completed with some outstanding photographs taken during a Christmas holiday in the Himalayan foothills beyond Darjeeling.

THE Dominions of India, Pakistan and Ceylon, and the adjacent territory of Burma, have for many years been I.C.I.'s largest overseas customers. The very numbers of the vast population of 450 million multiply their low purchasing power to give immense demands in total.

To the visitor India is one of the most fascinating countries. There is every kind of contrast. It contains some of the hottest parts of the earth and, in the Himalayan snows, some of the coldest. The masses live in abject poverty, and their rulers, the surviving princes and the modern industrialists, are among the wealthiest on earth. Much in Indian life is similar to that of medieval Europe, yet their newest industries compare with the best in the West. They comprise a dozen races and a hundred languages, and the two main groups, the Hindus and the Muslims, are poles apart in their way of life, their traditions, their dress and their architecture to an extent which seems beyond hope of reconciliation. Permeating all is the powerful influence of the British, whose 200-year rule has just ended.

Those who have spent their lives in India can scarcely claim to know it. The visitor from England can see only a fraction of it. In these series of photographs we have given a sample of the many different things seen in India and Pakistan, and of I.C.I.'s particular interests there.

BENGAL

CALCUTTA

The Victoria Memorial. This superb monument of white marble is popularly reputed to be a British attempt to equal the glories of the Taj Mahal.
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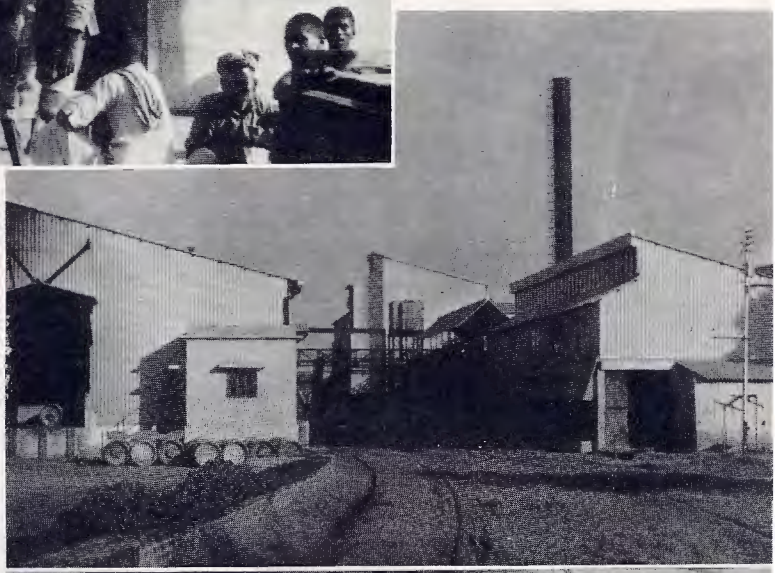
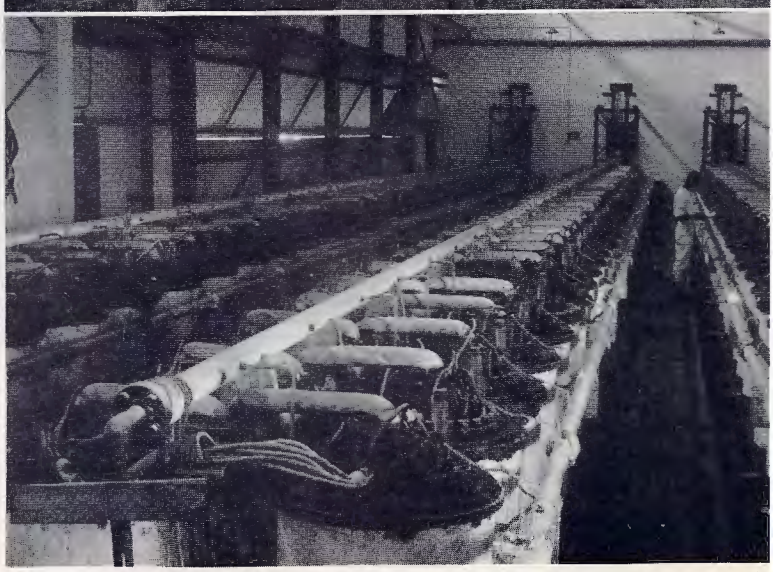
Entrance to the offices of I.C.I. (India) Ltd.: crowded pavements; Bengali customers coming and going in their numbers, characteristically attired in their dhoties.

Rishra Works of I.C.I. (India) Ltd.'s associated company, the Alkali and Chemical Corporation of India Ltd. This chlorine works supplies all local demands for liquid chlorine for papermaking, water treatment, etc. It is planned and operated entirely in accordance with the best practices of the General Chemicals Division. The cell room in Rishra Works. General Chemicals Division readers will recognise many familiar features in this unit.





Buoy store; spares for the Calcutta Port Authority.

Shipping in the river Hooghly. The great port of Calcutta is about 80 miles up river from the sea. The fine series of docks is insufficient to carry the trade of the port, and many ships have to berth in the stream, as shown in this photograph. The British ship in the centre is off-loading her cargo into lighters, and the ship on the right is Russian. In the distance is the big Howrah bridge, a cantilever bridge of unique construction built wholly in Indian steel during the war.
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SERINGAPATAM

A fine example of Muslim architecture: the Mosque of Tipu Sultan, who was famous for his part in the Southern Indian wars at the beginning of the nineteenth century. The Duke of Wellington made his early reputation in this campaign as a young colonel, and had his headquarters close to this mosque.

MADRAS

The Church of St. Mary's in the Fort. An example of British eighteenth-century colonial architecture at its finest. Fort St. George in Madras is one of the earliest British settlements in the East, having been established in 1644 by the East India Company.

TRAVANDRUM

Fantastic carved stone pillars at the entrance to the temple. A taste for Hindu sculpture takes some time to acquire, and to British eyes it seems at first to be over-ornate and unnaturally sensuous.

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MALABAR COAST

In the inland waterways near Cochin. These canals form the main channel of trade for 100 miles or more up and down this coast. The Malabar coast was one of the earliest territories settled by Europeans and is still full of the descendants of the early Portuguese, Dutch and British missionaries and traders. The climate is fully tropical.

BANGALORE

I.C.I. (India) Ltd.'s Bangalore distributor, Mr. Sreenivasa Charlu, with his son welcoming a consignment of light soda ash from Winnington. Buffalo carts drawn by oxen are the standard transport throughout the Indian peninsula.

TRAVANCORE

Salt production. Practically the whole of the vast tonnage of the salt produced in India is made from sea water by solar evaporation. The harvesting of salt is governed by an elaborate code of religious practices, and the first crop of the season is being raked in with appropriate ceremony.

Dhobies at work. Washing throughout India is performed by beating clothes against stones. In the higher classes of washing the clothes are first dipped in pots of soda. A sight like this can be seen outside any large Indian city; the dhobies are at work in the stream and the pots of soda are on the shore. Over the whole of India this use of soda accounts for no less than 50,000 *tons of soda ash.*